that obtained by Prof. Loomis, though the general fact of a great incurvature is thoroughly confirmed. My results are as follow:—

(1) The mean of 132 observations between lats. 15° and 22°, within 500 miles of the storm-centre, gives the angle 122° between the wind direction and its radius vector.

(2) The mean of 12 observations between the same latitudes, within 50 miles of the storm-centre, gives the angle 123°.

(3) The mean of 68 observations between N. lats. 8° and 15°, within 500 miles of the storm-centre, gives the angle 129°.

The observations within 50 miles of the storm-centre in the south of the Bay are too few to afford any trustworthy result.

For seamen's guidance, the following practical rules may be formulated:—

(1) In the north of the Bay of Bengal, standing with the back to the wind, the centre of the cyclone bears about five points on the left hand, or three points before the beam.

(2) In the south of the Bay, it bears about four points on the left hand, or four points before the beam.

(3) These rules hold good for all positions *within the influence of the storm*, up to 500 miles from the storm-centre. On the north and west the influence of the storm rarely extends to anything like this distance, but it does to the east and south.

Since much of this evidence, afforded by the Bay of Bengal cyclones, has been before the public for many years, it is incomprehensible to me how a man of M. Faye's scientific eminence can still assert that in the tropics "the wind arrows display an almost rigorous circularity." If, as may possibly be the case, he relies on the evidence of Mr. Piddington's memoirs, ignoring all subsequent work, it is only necessary to examine those memoirs to find that his data do not bear out that author's conclusions. In the charts which accompany Mr. Piddington's later memoirs, the wind observations are, as a rule, not shown, but only the ships' courses, and the author's interpretation of the positions and tracks of the storms. But the evidence is always fully given in the text, and it will be found that when the wind arrows are plotted therefrom, and are sufficiently numerous to allow of the position of the storm's centre being determined, which is far from being generally the case, they are reconcilable only with spiral courses, having a considerable incurvature.

I do not propose now to enter on a formal criticism of Mr. Piddington's work, the great merit of which, as that of a pioneer in the field of storm-science, no one more fully recognizes than myself; but so much seems necessary in explanation of the apparent glaring discrepancy between his results and those of modern workers in the same field.

The evidence of the cyclones of the Bay of Bengal, those tropical cyclones to which M. Faye appeals as authoritative on the validity of his views, is, then, conclusive against him. There is a strong influx of the lower atmospheric strata into a tropical cyclone, proving, in the most unquestionable manner, the existence of an ascending current over the vortex. This fact is quite independent of any views that may be entertained as to any theory of cyclone origin and movement of translation, but any such theory must harmonize with the fact, and hence I conceive that it is fatal to M. Faye's views. With these, in so far as they are theoretical merely, I have no present concern, but it is obviously a matter of high importance to seamen that they should not be misled as to the facts of the wind's movement in cyclones, and it is because the promulgation of such views as M. Faye's tends to perpetuate an old and now exploded error of fact, that I have to put in my protest against them.

HENRY F. BLANFORD.

Folkestone, June 15.

NOTES.

IT should have been stated in our paragraph last week relative to the opening of the Laboratory of the Marine Biological Association at Plymouth that the President, Prof. Huxley, who has given unremitting care to the affairs of the Association during the last three years, would be present if he were not prevented from taking part in any public proceedings by the state of his health. In the absence of the President, one of the Vice-Presidents of the Association, Prof. Flower, will preside. The Honorary Secretary, Prof. Ray Lankester, who founded the Association, and has conducted its affairs to the present issue, will also be present.

MR. J. J. H. TEALL, who now holds a foremost place among the petrographers of this country, has just been appointed to the Geological Survey. We understand that he will be specially charged with the study of the crystalline schists and the problems of regional metamorphism, and that he will be closely associated with the field officers who are mapping these rocks in different parts of Scotland. The Survey is to be heartily congratulated on this appointment. The staff is now remarkably strong, but the problems with which it is confronted are among the most difficult in geology. These problems have never been attacked by such a united force of field geologists and microscopists, who, working together with one common aim, will no doubt raise still higher the scientific reputation of the Survey, increase our knowledge of the history of the most ancient rocks, and throw light on some of the most puzzling questions in geological science.

THE electors to the Mastership of Downing College, Cambridge, have, by a unanimous vote, chosen Dr. Alexander Hill, Fellow of the College, to succeed Prof. Birkbeck. Dr. Hill's claim to the appointment sprang from his success as a teacher and worker in biology. No appointment to a Headship has been made on this ground alone since the revival of natural science at the Universities.

ON the 4th inst., Dr. Maxwell T. Masters was elected a corresponding member of the Institute of France, in the Botanical Section, in place of the late Prof. Asa Gray. Besides Dr. Masters, the following names appeared on the list of presentation: M. Treub, of Batavia; Mr. Triana, of Paris; M. Warming, of Lund; M. Wiesener, of Vienna. Dr. Masters obtained 39 votes; M. Triana, 5; M. Treub, 1.

THE Sorbonne, consulted as to the proposed creation of a Chair for the teaching of Darwinian theories, has not expressed disapproval of the scheme suggested by the Municipal Council of Paris. It has appointed a committee to report on the matter; and it is expected that no serious opposition will be offered to the proposal.

WE are glad to learn that a pension of £50 has been granted to Mrs. Balfour Stewart from the Civil List.

ON May 25, a complimentary dinner was given at the Queen's Hotel, Manchester, to Prof. Schorlemmer, of the Owens College, by his former pupils, to celebrate the occasion of the conferring of LL.D. upon him by the Senate of the Glasgow University, and to offer their congratulations. In the absence of Sir Henry Roscoe, who had been expected to take the chair, Mr. R. S. Dale, one of Prof. Schorlemmer's eldest pupils and friends, presided. Numerous congratulatory telegrams and letters were received by Dr. Schorlemmer, and early in the evening a letter was read from Sir Henry Roscoe, expressing regret that he could not be present, and testifying to his high appreciation of the ability of his old friend and colleague. Among those from whom congratulatory telegrams were received were Dr. Pauli, Director of the firm of Meister, Lucius, and Brüning, in Hoechst; Prof. Bernthsen, of the Badische Anilin und Sodafabrik, in Ludwigshafen; and Prof. Hermann Kopp, of Heidelberg, the historian of chemistry, who spoke of Prof. Schorlemmer's position as one of the principal pioneers of the science of organic chemistry and one of its foremost exponents, both as a teacher and a writer. Prof. Thorpe, F.R.S., proposed the health, long life, and prosperity of Dr. Schorlemmer, and referred to the fact that Glasgow, which had conferred honour on him, had produced such men as Black and Thomson, names familiar to all chemists.

DR. ASA GRAY left Harvard College in trust, to aid in the support of the Gray Herbarium of Harvard University, the copyrights of all his books, upon condition that proper provision should be made for the renewal and extension of these copyrights by new editions, continuations, and supplements, such as might be needed in the study of botany, and as might best enhance and prolong the pecuniary value of the bequest.

PROF. LOVERING has resigned the Chair of Mathematics and Natural Philosophy which he has held at Harvard for fifty years. In accepting his resignation, which takes effect in the autumn, the President and Fellows of the College have expressed warm appreciation of his services. Prof. Lovering has been President of the American Association, and still presides over the American Academy.

PROF. MCNAB, Swiney Lecturer on Geology in connection with the British Museum, will begin a course of twelve lectures on the fossil plants of the Palæozoic epoch on Monday next, at the Natural History Museum, Cromwell Road.

LAST night the *conversazione* of the Society of Arts took place at the South Kensington Museum.

A *conversazione* will be given by the Royal College of Surgeons, at the College, on Wednesday, June 27; and by the Royal Geographical Society, at Willis's Rooms, on Friday, June 29.

AN International Horticultural Exhibition is to be held at Cologne from August 4 to September 19.

WE have received from Messrs. West, Newman, and Co., samples of two kinds of botanical drying paper. One of the kinds differs but little from that which they have supplied for many years, which was originally manufactured, purposely for drying plants, by a paper-maker of the name of Bentall, who lived at Halstead in Essex, and contributed, a generation ago, to the distributions of the London Botanical Society. This paper has been largely used for the last thirty years, and combines in a very satisfactory manner the merits of a high degree of absorbence with a reasonable toughness. No doubt, for drying plants, it is the best paper that can be got, but yet, excepting grasses, Cyperaceæ, and mosses, one or more changes are required in the first few days to make satisfactory specimens in a climate like that of England. The new paper is quite without glaze, and seems a little more absorbent than the old "Bentall." The other kind is copied from an American model, a paper not made expressly for botanical use, sent to England by the late Dr. Asa Gray. It is twice as thick as the "Bentall," much more rigid, and very absorbent; a serviceable paper to mix with the lighter kind for home use, but too heavy to carry about in large quantities.

ACCORDING to *La Nature*, an immense terrestrial globe, constructed on the scale of one-millionth, will be shown at the Paris Exhibition of 1889. A place will be set apart for it at the centre of the Champ de Mars. The globe will measure nearly 13 metres in diameter, and will give some idea of real dimensions, since the conception of the meaning of a million is not beyond the powers of the human mind. Visitors to the Exhibition will see for the first time on this globe the place really occupied by certain known spaces, such as those of great towns. Paris, for instance, will barely cover a square centimetre. The globe will turn on its axis, and thus represent the movement of rotation of the earth. The scheme was originated by MM. T. Villard and C. Cotard, and *La Nature* says that it has been placed under the patronage of several eminent French men of science.

WE have received a sample of tobacco grown by Messrs. James Carter and Co., at a farm in Kent, and cured by Messrs. Cope Brothers and Co. It represents one of the first experimental crops brought to maturity, and passed through the various processes of manufacture, in this country, since the time of Charles II. The packet is accompanied by a card, on which we find the somewhat discouraging counsel: "Examine leisurely—use warily—smoke sparingly." Mr. Goschen was asked the other evening in the House of Commons whether he would cause an inquiry by experts into the results attending the experiment made by Messrs. Cope, with the view, if possible, of relaxing the fiscal restrictions upon the culture of tobacco in Great Britain. The Chancellor of the Exchequer cautiously replied that "only experience would show the value to smokers of this tobacco, and no inquiry by experts would be so valuable as that practical test. If any hon. member wished to try it, samples would be placed in the smoking-room. It was impossible to give any form of relaxation in the fiscal regulations which would injure the revenue."

ACCORDING to the *Kavkaz* newspaper, a shock of earthquake was felt at Julfa, in the Armenian province of Erivan, on May 15, about midday. The first shock was followed by a stronger one, which lasted for about three seconds, and seemed to have a direction from east to west.

THE Council of the Italian Meteorological Society held its first annual meeting at Turin on Sunday, April 15, under the presidency of Padre Denza. It was decided to hold the third general assembly of the Society at Venice, in September next, just before or after the Congress of the Alpine Club at Bologna. The establishment by the Society of a new Observatory in the Argentine Republic was notified, and also of four new meteorological stations in Italy. The arrangements being made with respect to the hygienic stations at five large cities were explained, as well as the proposed method of publication of the observations. The President submitted the Report of the Geodynamic Committee, nominated at the meeting at Aquila (NATURE, vol. xxxvi. p. 614), with reference to seismological observations and the protection of buildings. The Report, which is printed in the monthly Bulletin of the Italian Meteorological Society for May, consists of nine articles, and will be distributed to the Prefects and Mayors of districts liable to earthquake-shocks.

THE Hydrographer of the Admiralty has issued notices of the recent establishment of the following storm-signals:—(1) By the Japanese Government, at forty-seven stations on the coasts of Japan. A red ball, or one red light, to indicate that strong winds are probable from any direction. A red cone, or three red lights in the shape of a triangle, to indicate that strong winds are probable, at first from the northward or southward, according as the apex is upwards or downwards. (2) By the harbour authorities at Chittagong, relative to the signals at that port. A ball, or three lights placed vertically, to indicate that a severe cyclone is near Akyab, and will probably advance towards Chittagong. A drum, or two lights placed vertically, to indicate the early approach of a severe cyclone, with its attendant storm-wave. We take this opportunity of suggesting the desirability of introducing more uniformity in these signals in different countries, wherever practicable.

THE atomic weight of the element osmium has been re-determined by Prof. Seubert. The necessity for this re-determination has been felt ever since the principle of periodicity began to take firm root in the minds of chemists; and the more recent values arrived at for the atomic weights of iridium, platinum, and gold have tended to render this necessity even more imperative. The natural sequence, according to their chemical and physical properties, of the metals of the platinum group is generally accepted as—osmium, iridium, platinum, gold. Now the atomic weight of iridium as determined in 1878 by Seubert is 192·5, that of platinum as fixed by the same chemist in 1881 is 194·3, and that of gold as estimated last year by Thorpe and Laurie, and by Krüss, is 196·7, while the recognized atomic weight of osmium as given by Berzelius in 1828 is so high as 198·6. Obviously, if the grand conception of Newlands, Mendelejeff, and Lothar Meyer is correct, the atomic value of osmium required most careful revision. Such an undertaking, however, is endowed with peculiar interest owing to the dangerous nature of work with the osmium compounds, and many chemists who have been interested in this subject have been deterred by the knowledge that accidental contact with the fumes of the tetroxide, which are so frequently evolved by the spontaneous decomposition of many osmium compounds, might deprive them of the use of their eyes for ever. Prof. Seubert has happily succeeded without accident in establishing the validity of our "natural classification" by means of the analysis of the pure double chlorides of osmium with ammonium and potassium, $(NH_4)_2OsCl_6$ and K_2OsCl_6. Both these salts were obtained in well-formed octahedral crystals, of deep red colour while immersed in their solutions, but appearing deep black with a bluish reflection when dry, and yielding bright red powders on pulverization. The method of analysis consisted in reducing the double chlorides in a current of hydrogen: in case of the ammonium salt the spongy osmium which remained after reduction was weighed, and the expelled ammonium chloride and hydrochloric acid caught in absorption apparatus, and the total chlorine estimated by precipitation with silver nitrate. In case of the potassium salt the expelled hydrochloric acid was absorbed and determined, and the metallic osmium left after removal of the potassium chloride by washing was weighed. The mean value yielded by all these various estimations is 191·1, thus placing osmium in its proper place before iridium, and removing the last striking exception to the "law of periodicity."

At a recent meeting of the Washington Society of Anthropology, Mr. H. M. Reynolds read a paper on Algonquin metalsmiths. He expressed the opinion that the working of the copper-mines of Lake Superior is not of such high antiquity as has been supposed, and that it may have been continued until comparatively modern Indian times.

Some time ago the Smithsonian Institution issued inquiries as to the existence and geographical distribution of "rude and unfinished implements of the Palæolithic type." The *American Naturalist* says that responses have been received from thirty States and Territories. The implements already noted amount to between six and seven thousand, and their distribution extends nearly all over the United States. Several hundreds of implements—none of which seem to have been found in the mounds—have been sent to the Institution. The object of the Institution in undertaking this investigation was to determine whether there was in America a Palæolithic Age, and, if so, whether it had any extended existence.

The Free Public Libraries and Museum of Sheffield seem to be in a most flourishing condition. According to the last Report, which has just been sent to us, there has been a steady increase in the number of books issued. The number issued during the year ending August 31, 1887, was 410,395. The number issued during the previous year was 399,653, so that there was an increase of 10,742.

Messrs. Longmans, Green, and Co. have sent us a series of their test cards in mechanics, packed in neat little cardboard cases. The questions on the many and various branches of the subject are arranged in three stages. Each stage consists of about thirty cards with six questions on each, and is supplemented by cards containing the answers to all the numerical questions. The questions are excellently chosen, and are arranged in an intelligible and progressive order.

A careful and very valuable bibliography of the works of Sir Isaac Newton, with a list of books illustrating his life and works, by G. J. Gray, has just been issued by Messrs. Macmillan and Bowes, Cambridge. The bibliography is divided into ten sections: (1) collected editions of works; (2) the "Principia"; (3) "Optics"; (4) "Fluxions"; (5) "Arithmetica Universalis"; (6) minor works; (7) theological and miscellaneous works; (8) works edited by Newton; (9) memoirs, &c.; (10) index.

A new edition of the late Prof. Humpidge's translation of Dr. Hermann Kolbe's "Short Text-book of Inorganic Chemistry" (Longmans) has been issued. The greater part of this edition was prepared by Dr. Humpidge last summer. Being unable, owing to failing health, to complete the task of revision, he asked Prof. D. E. Jones, of the University College, Aberystwith, to undertake it, and to see the book through the press.

A Report, with admirable illustrative maps, on the geology and natural resources of part of Northern Alberta, and the western parts of the districts of Assiniboia and Saskatchewan, by Mr. J. B. Tyrrell, Field Geologist of the Geological Survey of Canada, has just been published at Montreal. The Report is, to a certain degree, preliminary, but the author hopes that, for the present at all events, it may suffice as a guide to the extent, position, and character of the mineral wealth of the district.

An interesting paper by Mr. Tyrrell, giving an account of the journeys of David Thompson in North-Western America, has been issued at Toronto. It was read lately before the Canadian Institute, and is published in advance of the Proceedings by permission of the Council. The materials for this narrative are contained in Mr. Thompson's field note-books and journals, which are preserved in the office of the Crown Land Department of Ontario. Mr. Thompson died in 1857 at the age of eighty-seven.

Mr. Leland will shortly send to the printer his work on "Americanisms," which will follow on the "Dictionary of Slang, Jargon, and Cant" now in the press. It will contain much folk-lore in the form of proverbs, songs, and popular phrases, and also the etymology and history of the words, as far as they could be traced. The work will include an account of American dialects, such as Pennsylvanian Dutch, Chinook, Creole, and Gumbo. A number of American scholars will deal with special subjects.

We have received a copy of the *Tōyō Gakugei Zasshi* (the *Eastern Science Journal*), printed in Japanese characters. This magazine is published monthly, and is edited by a committee, most of whose members are Professors of the Imperial University at Tokio. Nearly 3000 copies of each number are sold.

The first part of the second volume of the Journal of the College of Science, Imperial University, Japan, has been sent to us. The contents include, besides a mathematical paper, in German, by Dr. P. R. Fujisawa, the following articles in English: on the composition of bird-lime, by Dr. E. Drivers, F.R.S., and Michitada Kawakita; on anorthite from Miyakejima, by Yasushi Kikuchi; the source of *Bothriocephalus latus* in Japan, by Dr. Isao Ijima; and earthquake-measurements of recent years, especially relating to vertical motion, by S. Sekiya.

MESSRS. D. C. HEATH AND CO. (Boston) will publish at once Compayre's "Lectures on Pedagogy: Theoretical and Practical," a companion volume to their Compayre's "History of Pedagogy." It is translated and annotated by Prof. Payne, of the University of Michigan.

PROF. J. VIOLLE has just issued the first part of the second volume of his "Cours de Physique." The present part relates to acoustics.

WE reprint from *Science* of June 1, 1888, the following suggestive paragraph:—"The Committee of the House of Representatives on acoustics and ventilation has actually reported favourably a Bill appropriating seventy-five thousand dollars to subsidize a man who thinks he can construct a steel 'vacuum' balloon of great power. He is to be allowed to use the facilities of one of the navy-yards for the building of his machine, and is to have the money as soon as he has expended seventy-five thousand dollars of private capital upon his air-ship. One of the mathematical physicists of Washington was asked by a member of Congress whether such a balloon could be successfully floated. He set to work upon the problem, and here are some of his results, which are rather curious:—A common balloon is filled with hydrogen gas, which, being lighter than air, causes the balloon to rise and take up a load with it. But, as the pressure of the gas within is equal to the pressure of the atmosphere without, no provision other than a moderately strong silk bag is required to prevent collapse. The inventor of the proposed steel balloon hopes to gain greater lifting-power by using a vacuum instead of gas, the absence of substance of any kind being lighter than even hydrogen gas. But he has to contend with the tendency of the shell to collapse from the enormous pressure of the atmosphere on the outside, which would not be counterbalanced by anything inside of it. The first question which presented itself was, How thick could the metal of the shell be made, so that the buoyancy of the sphere, which would be the most economical and the strongest form in which it could be constructed, would just float it without lifting any load? The computations showed that the thickness of the metal might be ·000055 of the radius of the shell. For example: if the spherical shell was one hundred feet in diameter, the thickness of the metal composing it could not be more than than one-thirtieth of an inch, provided it had no braces. If it was thicker, it would be too heavy to float. Now, if it had no tendency to buckle, which of course it would, the strength of the steel would have to be equivalent to a resistance of more than 130,000 pounds to a square inch to resist absolute crushing from the pressure of the air on a cross-section of the metal. Steel of such high crushing-strength is not ductile, and cannot be made into such a shell. If the balloon is to be braced inside, as the inventor suggests, just as much metal as would be used in constructing the braces would have to be subtracted from the thickness of that composing the shell. Of course, such a shell would buckle long before the thickness of the metal of which it was composed was reduced to ·000055 of its radius. In other words, it is mathematically demonstrated that no steel vacuum balloon could be constructed which could raise even its own weight. This is an illustration of how intelligently Congress would be likely to legislate on scientific matters unguided by intelligent scientific advice."

THE additions to the Zoological Society's Gardens during the past week include two Pig-tailed Monkeys (*Macacus nemestrinus* ♂ ♀) from Java, presented by Mr. C. W. Ellacott; a Bonnet Monkey (*Macacus sinicus* ♀) from India, presented by Mr. J. Wiltshire; a Pig-tailed Monkey (*Macacus nemestrinus*) from Java, presented by Mrs. Gleig; two Spotted Cavys (*Cœlogenys paca* ♂ ♀) from South America, presented by Mr. W. H. Stather; a Mauge's Dasyure (*Dasyurus maugæi*) from Australia, presented by Mr. H. R. Brame; three Abyssinian Sheep (*Ovis aries*, var.) from Abyssinia, presented by Mr. A. J. Baker; two Pallas's Sand Grouse (*Syrrhaptes paradoxus*) from the Island of Tiree, Argyllshire, presented by Lieut.-Colonel Irby and Captain Savile Reid, F.Z.S.; a Wapiti Deer (*Cervus canadensis* ♂), born in the Gardens.

OUR ASTRONOMICAL COLUMN.

THE CONSTANT OF ABERRATION.—In the year 1862, Prof. J. S. Hubbard commenced a series of observations of α Lyræ with the prime vertical instrument of the Washington Naval Observatory, which was continued by either Profs. Newcomb, Harkness, or Hall until 1867. The purpose of these observations had been to obtain corrections to the assumed values of the constants of nutation and aberration, and to afford an absolute determination of the annual parallax of the star. The series was not continued for a sufficient period for the first purpose; and Prof. Asaph Hall, when engaged on the determination of the parallax of α Lyræ by another method, found that these observations would give it a small negative value. From this and other circumstances he was at that time induced to think the observations would not repay the trouble of a careful discussion; but recently, reflecting that they had been skilfully designed, and carried out with care, he resolved to ascertain the result they would furnish for the constant of aberration. The observations commenced 1862 March 25, and extended to 1867 April 25, and were 436 in number. The mean resulting value of the parallax is—

$$\pi = -0''{\cdot}079 \pm 0''{\cdot}0134,$$

whilst

$$\text{Constant of aberration} = 20''{\cdot}4506 \pm 0''{\cdot}0142,$$

with an average probable error for a single observation of $\pm 0''{\cdot}174$.

Adopting a parallax of $+0''{\cdot}15$, the result would be—

$$\text{Constant of aberration} = 20''{\cdot}4542 \pm 0''{\cdot}0144.$$

Prof. Hall prefers this latter result, notwithstanding the uncertainty as to the true parallax of the star. The negative result obtained for the parallax may probably be due to the fact that the coefficient of parallax obtains its extreme values in January and July, when the mean temperature is likewise at its extreme points; the January observations also are made in daylight, but the July at night, which would tend to produce a systematic difference in the method of observing. The coefficient of aberration, on the other hand, has its greatest values in April and October, when the conditions of observation will be nearly the same.

The above value of the constant of aberration gives, for the solar parallax—

$$\pi = 8''{\cdot}810 \pm 0''{\cdot}0062,$$

Hansen's values of the mean anomaly of the earth, and eccentricity of its orbit being assumed, together with Clarke's value for the equatorial radius, and Michelson and Newcomb's determination of the velocity of light, viz. 186,325 miles per second.

THE MARKINGS ON MARS.—The observations of M. Perrotin at Nice, and M. Terby at Louvain, and, in England, of Mr. Denning at Bristol, have confirmed the presence on the planet of most of the "canals" or narrow dark lines which were discovered by M. Schiaparelli in 1877, and at subsequent oppositions. M. Perrotin has also been able to detect, in several cases, the gemination or doubling of the canals, and M. Terby has observed the same phenomenon in one or two cases, but with much greater difficulty than in the opposition of 1881–82. But some curious changes of appearance have been noted. An entire district (Schiaparelli's *Lybia*) has been merged in the adjoining "sea," *i.e.* its colour has changed from the reddish hue of the Martial "continents" to the sombre tint of the "seas." The district in question is larger than France. To the north of this district a new canal has become visible, and again another new canal has appeared to traverse the white North Polar cap, or, according to M. Terby, to divide the true Polar cap from a white spot of similar appearance a little to the south of it. With the exception of these changes, the principal markings, both light and dark, are those which former oppositions have rendered familiar.